



Industry Response Status to Near Term Task Force Recommendations 2.1 & 2.3 – Seismic

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Regulatory Information Conference

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US Regulatory Actions Following Fukushima

- NTTF Recommendations July 12, 2012
- Request for Information (50.54(f) letter) March 13, 2012
- Recommendation 2 (seismic)
 - -2.1 Reevaluate seismic hazard and, if necessary, update design basis and SSCs
 - 2.2 Confirm seismic hazard every 10 years
 - 2.3 Perform seismic walk-downs of sample of equipment



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Objectives for Recommendation 2.3 – Seismic Walkdowns

- Objectives Stated in 50.54(f) Letter:
 - Identify and Address Degraded or Non-Conforming Conditions to the Seismic Design Basis
 - Apply lessons learned from:
 - Fukushima Dai-ichi and Daini and Onagawa 2011 Events
 - North Anna Mineral VA earthquake of August 23, 2011
 - Prompt walkdown review of all US Plants followed by documentation of results
- Status of 2.3 Seismic Walkdowns

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- Criteria Document Completed for Walkdowns (with NRC approval), EPRI 1025286
- EPRI Training conducted across US
- Walkdowns completed at all US NPPs
- Plant-specific submittals to NRC completed

Results from 2.3 Seismic Walkdowns	
On the order of 100 components reviewed at each plant Limited issues identified at most plants "Housekeeping" type issues Some seismic interactions found Differences in plant drawings and actual configuration Corrective Action Programs (CAP) typically used to resolve issues NRC currently reviewing submittals	
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50.54(f) 2.1 Requested Information - Seismic	
Site specific seismic hazard Site specific performance based ground motion response	
spectrum (GMRS) • Licensing basis safe shutdown earthquake (SSE) spectrum	_
 If GMRS > SSE, then perform risk evaluation Plant Risk Evaluation 	
- Seismic PRA	
Risk based Seismic Margin AssessmentSpent Fuel Pool evaluation	
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Industry Response to 50.54(f) Seismic	
Seismic Evaluations Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima	
Near-Term Task Force Recommendation 2.1: Seismic Expert Team Assembled to Develop Seismic Process John Richards, Bob Kassawara, Jeff Hamel, Stuart Lewis (EPRI)	
- Kimberly Keithline (NEI) - Greg Hardy and Kelly Merz (SGH)	
Robert Kennedy (RPK SMC) Divakar Bhargava (Dominion Resources)	
Robin McGuire (Lettis Consultants) Walt Silva (Pacific Engineering)	
- Don Moore (Southern Company)	
Bob Whorton (South Caroline Electric and Gas)Doug True (ERIN Engineering and Research)	
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Screening, Prioritization, & Implementation	
(SPID) Details	
EPRI Report 1025287, November 2012 (Draft) 1. Purpose and Approach	
Seismic Hazard Development	
GMRS Comparisons and Screening of Plants	
Seismic Hazard and Screening Report	
5. Prioritization (Schedule)	
6. Seismic Risk Evaluation	
7. Spent Fuel Pool Evaluation	
Four appendices to SPID with detailed guidance on special topics	
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Key SPID Positions - PSHA/GMRS, Screening, High	
Frequency	
PSHA and GMRS Calculations	
- Updated GMPEs	
 Guidance for site amplification methods 	
Clarified positions on the SSE control point	
Screening SSE to GMRS screening	
Screening evaluation focused on 1 to 10 Hz range	
Guidance for special cases (narrow banded exceedances	
and low frequency exceedances) – IPEEE capacity to GMRS screening	
Criteria for "quality" of the IPEEE	
Separate high frequency "confirmation" based on EPRI research	
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Key SPID Positions – SPRA Implementation Guidance	
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Structural and SSI Response	
 Structure modeling Seismic response scaling 	
 Fixed-based analysis criteria for sites previously defined as 	
"rock" • Fragility/Capacity Calculations	
Hybrid approach for fragility calculations	
High frequency capacitiesCapacity-based SSC selection	
Additional Guidance	
- Large Early Release Frequency (LERF)	
Comparison to ASME/ANS StandardPeer Review	
- SPRA Documentation	

SPID - Current Status • NRC endorsed 2/15/2013 - Clarifications on 4 items • NRC endorsement starts the clock for the utility 60-day responses · Number of plants that will screen out of full risk evaluations is unknown but expected to be less than half • 50.54(f) schedules were judged to be unachievable unless new hazards are much lower than expected EPEI RESEARCH INSTITUTI **Industry Proposed Augmented Approach** • Described approach to NRC in public meetings Nov. 14 and Dec. 13. - Primary benefit: Enables safety enhancements sooner - Additional near-term work means some SPRAs will be completed later · Reviewed draft guidance document in public meeting Feb. 14 - General agreement on criteria - Working to resolve remaining comments EPEI RESTRUCTION POWER **Augmented Approach - Plan** • Develop new hazard curves and GMRS as requested in 50.54(f) letter • Perform an additional interim evaluation (limited scope, simplified deterministic evaluation) and make appropriate plant modifications. • Perform a number of "early SPRAs" to develop a more consistent set of implementation expectations and share lessons learned throughout the industry Perform all of the activities required under the 50.54(f) letter, consistent with the SPID guidance, but on a more attainable schedule EPEI RESEARCH INSTITUTI

Proposed Augmented Approach for Seismic

				2012	2013	2014		2015	2016	2017	20	18	2019	2020
	Expedited nic Evaluation	Process (ESEP)	CEUS	Seismic I Develop		ESEL Seismic Evaluation			ESEL Mods w/ Outages					
yach	Expedited Seismic Evaluation	Process	WUS	Seism	ic Hazard I	Development	ESEL Seismic Evaluatio	ESEL Seismic Modifications ESEL Mods						
Augmented Approach	Seismic Risk Evaluations	tions				Early Seismi & Less			ns					
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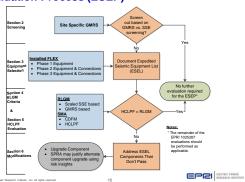
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ESEP - Scope of Equipment

- Include a subset of installed plant equipment needed for FLEX
 - Will typically include tanks and mechanical and electrical equipment
- Structures, other SSCs (e.g., piping, cable trays, NSSS), and some two-over-one interactions would be deferred to the complete SPRA/SMA under the 2.1 resolution

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Industry Proposed Expedited Seismic Evaluation Process (ESEP)



Augmented Approach ESEP - Key Dates

Activity	CEUS Plants	WUS Plants
Calculate GMRS	September 2013	March 2015
Perform interim evaluation	September 2014	January 2016
Complete mods not requiring an outage	December 2016	June 2018
Complete mods requiring an outage	Within 2 outages of December 2014	Within 2 outages of January 2016

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Expedited Seismic Evaluation Approach (ESEP)

- If GMRS > SSE between 1 and 10 Hz, develop a Review Level Ground Motion (RLGM) by scaling up the SSE so that it envelopes the GMRS between 1 and 10 Hz (not to exceed 2 x SSE or 0.75g PGA)
- Derive in-structure motion using existing SSE-based ISRS scaled up consistent with the RLGM
 - Alternate approach for ongoing SPRAs

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- Perform HCLPF evaluations using guidance such as EPRI NP-6041-SLR1 and EPRI TR-103959
- For equipment whose HCLPF < RLGM, implement plant modifications to achieve a HCLPF > RLGM

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Current Status: Industry Response to Seismic

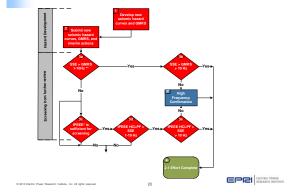
- Seismic Screening/Prioritization Implementation Document (SPID) endorsed by NRC
- Augmented Approach Expedited Seismic Evaluation Process
 - Draft submitted to the NRC early February
 - Meetings with the NRC Feb/March
- Seismic hazard nearing completion
 - Hard rock hazard nearly complete
 - Site amplification and GMRS complete in late summer or
- · Several SPRA First Movers already in process

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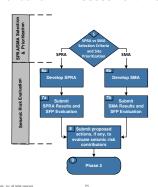
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Recommendation 2.1 Assessment Process



Recommendation 2.1 Assessment Process



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